Natural Heritage &
Endangered Species
Program

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Natural Community Fact Sheet:
ROCKY SUMMIT/ROCK OUTCROP COMMUNITIES

Community Descriptions:

Circumneutral Rocky Summit on Mt. Tom. P. Swain

Rocky summit/rock outcrop communities are natural open areas dominated by grasses, sedges, and herbaceous plants or by shrubs. Lichens and/or mosses are often an important component on the undisturbed exposed rock surfaces. Vegetation is confined to cracks in the rocks or to areas of shallow soil between the rock outcrops. Trees, when present, are widely scattered and often stunted. In addition to supporting species primarily associated with open areas, these communities share some of the herbaceous species of the surrounding forested vegetation. The rocky summit/rock outcrop communities appear to be relatively stable, perhaps because the shallow, dry, soil or steepness of the site makes it difficult for tree species to establish. Fire or other types of disturbance such as grazing may also help keep these areas open. These rocky summit/rock outcrop communities are of interest because there are few non-forested terrestrial communities in Massachusetts, so that many species found on these sites are uncommon in the state.

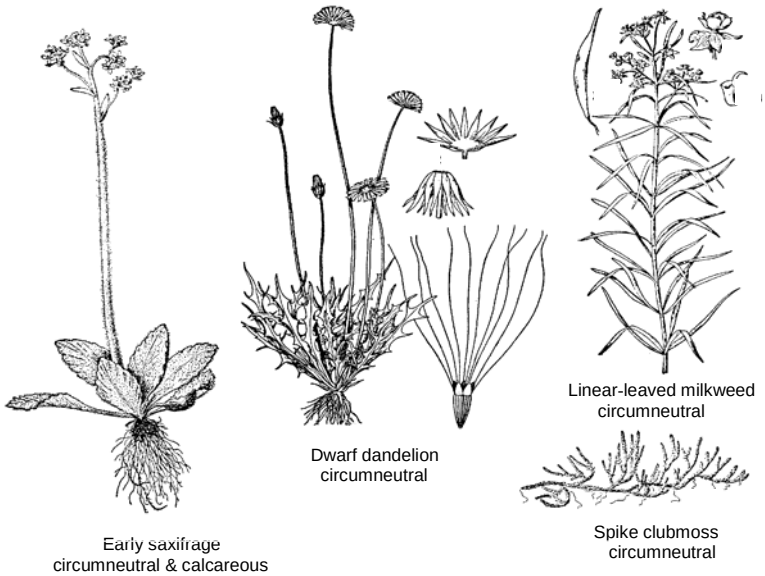
Three rocky summit/rock outcrop communities can be recognized depending on whether the exposed bedrock is acidic (pH < 6.0), circumneutral (pH 6.0 - 7.5), or calcareous (pH > 7.5). The acidic rocky summit/rock outcrop community is dominated by low shrubs with grasses, sedges, and a few herbaceous species forming a secondary component. In the circumneutral rocky summit/rock outcrop community, grasses, sedges and a variety of herbaceous species make up the majority of the vegetation. The calcareous rocky summit/rock outcrop community is dominated by both shrubs and herbaceous plants with the steeper, moister ledges and cliffs supporting a rich community of ferns. Some of the species of the rocky summit/rock outcrop communities, particularly those on circumneutral substrates, also occur in the tall grass prairie of the upper Mid-West or on various types of bedrock openings within the Eastern Deciduous Forest. However, unlike the bedrock communities of the un-glaciated regions of the Eastern Deciduous forest, the rocky summits/rock outcrop communities in Massachusetts do not have species which are unique to them.

Environment:

These communities are found on the rocky summits of hills and mountains where bedrock is exposed, or on rock outcrops of the upper and mid-slopes of these areas. Outcrops of bedrock supporting these communities are usually found as a series of steep ledges or cliffs, however, some areas, particularly those on summits, can be flat. The typical aspect ranges from

southeast through southwest. Most occurrences of the community are small (less than ¼ acre), and can occur as clusters separated by a forested matrix. Soil, when present, is shallow. Most of the sites where these communities occur are dry, probably due to a combination of the steep slope so that rainfall runs off rapidly, and shallow soil. The microclimate of the acidic and circumneutral rocky summit/rock outcrop communities, and ridge top calcareous communities is more extreme than the adjacent forested areas and have greater fluctuations in temperature and relative humidity and more wind. The calcareous summit/rock outcrop community, usually found on mid-slope ledges, is relatively moist. It is typically partly shaded by trees of the rich, mesic forest community. The Acidic rocky summit community is often associated with a dry oak and pitch pine forest while the circumneutral rocky summit community is associated with the hickory-hop hornbeam forest.

Gleason, H.A. The New Britton and Brown Illustrated Flora of the Northeastern U.S. and Adjacent Canada. New York Botanical Garden, 1952.



Some Plant Species of Rocky Summit/Rock Outcrop Communities

Characteristic Plant Species in Massachusetts:

Acidic and circumneutral rocky summit communities share a number of widespread species of open areas such as little bluestem grass (*Schizachyrium scoparium*), poverty grass (*Danthonia spicata*), Pennsylvania sedge (*Carex pensylvanica*) and rock harlequin (*Corydalis sempervirens*). They differ in that the acid rocky summit community has a greater proportion of low shrubs including scrub oak (*Quercus ilicifolia*), and blueberries (*Vaccinium pallidum,* and *V. angustifolium*). Trees include pitch pine (*Pinus rigida)* and several species of oak (*Quercus* sp.). In contrast, the cirumneutral rocky summit/rock outcrop community has a much richer herbaceous flora including species such as rusty cliff fern (*Woodsia ilvensis*), rock spikemoss (*Selaginella rupestris*), dwarf dandelion (*Krigia virginica*), sleepy catch fly (*Silene anterrhina*), and slender knotweed (*Polygonum tenue*) as well as a variety of grasses (*Agrostis, Aristida, Panicum*). The occasional tree is likely to be eastern red cedar (*Juniperus virginiana*), hickory (*Carya glabra* or *C. ovata*), or white ash (*Fraxinus americana*). Some of the herbaceous species of the circumneutral rocky summit/rock outcrop community are also common on calcareous substrates. Species found in these two communities include early saxifrage (*Saxifraga virginiensis*), columbine (*Aquilegia canadensis*), and balsam groundsel (*Senecio pauperculus).* However, shrubs of the calcareous sites which can include round-leaved dogwood (*Cornus rugosa*) and roundleaf shadbush (*Amelanchier sanguinea*) differ, as do a number of the herbaceous species including ivory sedge (*Carex eburnea*). Ferns such as bulblet fern (*Cystopteris bulbifera)*, fragile fern (*C. tenuis)*, ebony spleenwort (*Asplenium platyneuron)*, maidenhair spleenwort (*A. trichomanes),* and blunt lobed wood fern (*Woodsia obtusa*), are found on the steep mid-slope ledges of the calcareous rocky summit/rock outcrop community.

Rare Plant Species in Massachusetts:

The acidic rocky summit/rock outcrop community does not have rare plants associated with it. The circumneutral rocky summit/outcrop community has four rare species associated with it. These are linear-leaved milkweed (*Asclepias verticillata*) (T) a species also found on the tall grass prairie, green rock cress (*Arabis missouriensis*) (SC), which is also found in small openings in the hickory-hop hornbeam community, Michaux's sandwort (*Minuartia michauxii*) (SC), and arrow-leaved vervain (*Verbena simplex)* (E). Dryer ridge tops of the calcareous rocky summit/rock outcrop community support downy arrowwood (*Viburnum rafinesquianum*) (T), roundleaf shadbush (*Amelanchier sanguinea*) (SC), hairy honeysuckle (*Lonicera hirsuta*) (E), and herbaceous plants including long-leaved bluet (*Hedyotis longifolia*) (T), and false pennyroyal *(Trichostema brachiatum*) (E). The more mesic cliff areas include wall-rue spleenwort (*Asplenium ruta-muraria*) (T). Other rare species associated with the calcareous rocky summit/outcrop community include lyre-leaved rock-cress (*Arabis lyrata*) (T), northern prickly rose (*Rosa acicularis*) (E), purple clematis *(Clematis occidentalis)* (SC), smooth rock-cress (*Arabis laevigata*) (T), Michaux's sandwort (*Minuartia michauxii*) (SC), and devil's bit (*Chamaelirium luteum*) (E).

SC = State Special Concern, T= State Threatened, E = State Endangered

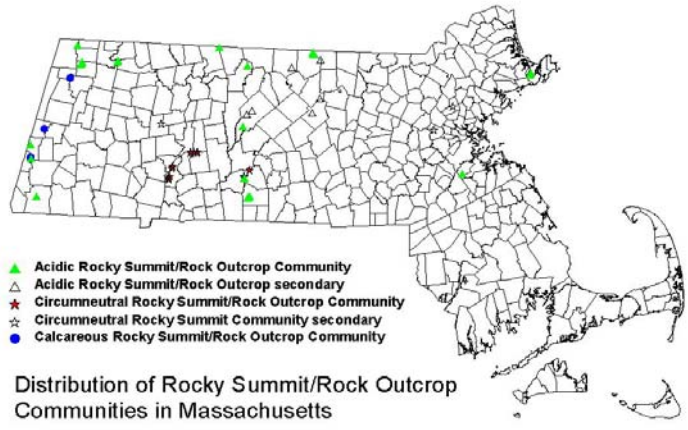
Characterisitc Animal Species in Massachusetts:

The acid and circumneutral rocky summit/rock outcrop communities with their open, south facing slopes provide good habitat for snakes. Deer are common on circumneutral areas at least in winter. Ravens sometimes nest on cliffs and ledges supporting these communities.

Rare Animal Species:

Box turtle (*Terrapene carolina*) (SC) has been observed in a few of the circumneutral rocky summit/rock outcrop sites.

SC = State Special Concern



Distribution of Rocky Summit/Rock Outcrop Communities in Massachusetts

Range:

Acidic rocky summit/rock outcrop communities are found state wide, with good examples in southern Berkshire County at Alander Mountain, Mt. Race and Mt. Everett and in eastern Essex County on and near Cape Ann. The circumneutral rocky summit/rock outcrop community is also widespread. The greatest concentration is in the Connecticut River Valley in Hampden, Hampshire and Franklin Counties. Some of the best examples are on Mount Tom, and in the Holyoke Range. Areas supporting this community are also found on Horn Pond Mountain and Prospect Hill in

eastern Middlesex County. The calcareous rocky summit/rock outcrop community is the most restricted and is only found in Berkshire County within the Western New England Marble Valleys/Housatonic and Hoosic Valleys sub-ecoregion. Bartholomew's Cobble has a good examples of this community.

Similar communities occur on the appropriate substrates in Connecticut, New Hampshire, New York, and Vermont.

Threats and Management Recommendations:

The major impact to these types of communities appear to be trampling by people. Trails tend to run on ridge tops and when the open areas supporting these communities are encountered, they invite viewing, picnics, and sometimes camping, all of which can easily degrade the vegetation and destroy the lichen and moss cover on the rocks. The steeper slopes and cliffs are more secure except where the rock is of sufficient quality to attract rock climbers. Educating the public and re-routing the trails, when possible, are probably the best way to protect these natural open areas.

Other threats include grazing and invasive species. Browsing has been observed on rare species, but browsing by deer may also help to keep tree seedlings out and is probably not a problem at the present. Invasive species have only been noted on the more mesic calcareous ledge outcrops. Because the calcareous rocky summit/outcrop community supports a great many state rare species these sites should be monitored closely to make sure the invasive plants are not shading out the rare species.